

The Relationship Between Smoking, Accident and Visual Acuity Among Okada Riders in Esan West Local Government Area of Edo State

Ovienria W. A.¹, Ernest-Nwoke I. O.², Enock M. E.¹

¹Department of Ophthalmology, Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria

²Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine, Ambrose Alli University, Ekpoma, Edo State, Nigeria

Email address

uwaifoha@yahoo.co.uk (Ernest-Nwoke I. O.)

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Abstract

Despite its implication in disabilities and deaths, the prevalence of smoking is on the increase and the trend is worrisome among adolescents and young adults. Its relationship with accidents; a major cause of morbidity and death, has received little attention. This study therefore assesses the association between smoking, accidents and visual acuity. The study is a cross sectional descriptive study targeted at motor bike riders (Okada) in Ekpoma, the administrative headquarters of Esan West Local Government Area of Edo State. Using questionnaire, demographic profiles, history of smoking and accidents were obtained from 150 Okada riders who gave consent for the study. Visual acuity was assessed using the Snellen lettered chart following standard procedures. Data was analyzed using SPSS (version 20) and results presented in suitable tables. The results showed high poor visual acuity (104; 69.3%) and smoking strongly correlates with accident among the Okada riders. It was observed that Okada riders with poor visual acuity (both eyes) were 1.49 times more likely to have bike accident compared to those with good visual acuity. It was also observed that Okada rider who smokes is 1.01, 1.83 and 1.00 times more likely to have poor visual acuity in both, right and left eyes respectively compared to non-smokers. This study therefore indicates the need for visual screening exercise among Okada riders to abate the prevalence of accidents with a view of educating them on the danger of smoking.

Keywords

Smoking, Accident, Visual Acuity, Okada Riders

1. Introduction

The trend of road traffic accident has declined in most developed countries; the reverse is the case in the developing nations (Willette and Walsh, 1983). Specifically, it is endemic in Nigeria, with seasonal epidemics (Asogwa, 1978). It was documented that in Nigeria 1 out of 3 and 1 out of 9 stand the risk of getting injured or killed respectively from road traffic accident, on a yearly basis (Ezenwa, 1986). It is even more disturbing to note that the young adults group, which forms the economic back-bone of a nation, is most affected by this menace (Asogwa, 1980; Oyemade, 1973).

Numerous studies have discussed the susceptibility of smoking to higher motor vehicle and non-motor vehicle injuries (Kaufman et al., 2000; Friedman et al., 1997; Doll et al., 1994; Kawachi et al., 1993; Tverdal et al., 1993; Ryan et

al., 1992; Tsai et al., 1990; Ross et al., 1990; Rogot and Murray, 1980) and the issue has recently been a subject of review and meta-analysis (Leistikow et al., 1998; Sacks and Nelson, 1994). Worrisome is the fact that while smoking is recognized as the most important preventable risk factor for certain diseases, disabilities and death, according to Peto and Lopez (2001), its prevalence among youths is an issue of public health significance.

Interestingly, a mass visual field screening study among drivers in California found that both accident rate and conviction rate in groups with visual field loss were more than twice as high, as for age and sex matched control group with normal vision (Johnson and Keltner, 1983). Considering the connection between smoking and accident by several studies; as above, and the fact by Johnson and Keltner (1983), we therefore hypothesized that the influence of smoking on vision may be the cause of the higher motor vehicle and non-

motor vehicle accidents. Indeed, it is reported that smoking fatally affects nearly every organ of the body, causes many diseases, and worsens the general health (Khalaj et al., 2014). Specifically, smoking has been documented as a major contributing risk factor for visual impairment such as nuclear cataract, diabetic retinopathy and age-related eye diseases (Thornton et al., 2007; US Department of Health and Human Services, Centers for Disease Control and Prevention, 2004; The Eye Disease Case-Control Study Group, 1992).

On the other hand, studies by Burg (1968), Council and Allen (1974) in the USA and Davidson (1985) in the UK showed correlation between visual field defect and accident record. However, Taylor (1982) reported that there was no evidence of a progressive increase in the accident rate with the deterioration in the total visual field. In Nigeria, Nwosu (1991) found no significant association with road traffic accident but reported a prevalence of 3.9% visual field defect amongst drivers in Ibadan. Okafor's (1992) investigation on Nigerian Police drivers and Effiong's (1993) study on Taxi Park Drivers in Enugu, found no significant association between road traffic accident and visual field defect in their studies. Despite the conflicting findings between these studies, little has been researched on in this regards. Moreover, paucity of literature is the case among Okada drivers (bike riders) which is becoming a more prevalent means of transportation. In addition, no study of a kind has been conducted in Edo State; whose population and road traffic accident is among the leading in Nigeria. It is therefore the aim of this study to investigate the relationship between smoking, accident and visual acuity among Okada riders in Esam West Local Government Area of Edo State, Nigeria.

2. Material and Method

Study Area: The study was conducted in Esan West Local Government Area of Edo State, Nigeria. The area lies between latitude 60 40°N 60 45°N and longitude 60 05°E 60 10°E (Obabori et al., 2006). However, Ekpoma-the administrative head quarter of the Local Government Area was chosen due to the qualities of this area. More so, the area is favoured with dense population of Okada rider probably because the area houses the State owned University (The Ambrose Alli University), several banks, secondary and primary schools and small businesses. These have contributed to the area been transformed from a rural community to semi-urban area.

Targeted Population: The target population was the Okada riders in the study area. Okada riders in Nigeria refer to individuals who ride motor bike for commercial purposes and this serves as occupation for them.

Inclusion Criteria: Subjects between the ages of 20 and 40, with no history of eye problems (visual pathology) and or head trauma and normal eye health were included in this study.

Exclusion Criteria: Subjects who use glasses for correction of refractive errors, are above the age of 40 years, and have a history of visual impairment, as well as those who

are on medication due to illness were excluded for this study.

Data collection: Data for this study came from two primary sources; a direct interview with questionnaire and physical examination. Visual acuity screening was carried-out in the open field during the day, using the Snellen's lettered chart. Visual acuity in both eyes and each eye separately were assessed in line with Smith and Maure (1995), Darling and Thorpe (1975), and Garland's (1995) recommendation. This was measured with a Snellen lettered chart. Respondents were tested at standard distances of six metres. The Snellen lettered chart was hung on a wall at a distance of 6 metres at a height of 2 metres. Visual Acuity was measured one eye at a time (mono-cularly) with each respondent standing and facing the chart and then reading out the letters on the charts starting from the biggest one to the smallest readable. The eye not being measured was covered with a hand-held occluder held in place by the researcher. Visual acuity of 6/6 - 6/18 considered to be normal was classified as good vision while < 6/18 - 6/60, < 6/60 - 3/60 and less than 3/60 considered as visual impairment, severe visual impairment and blindness respectively (WHO, 1984) were classified as poor vision. Okada riders with poor vision were referred to the eye clinic of the Irrua Specialist Teaching Hospital for further evaluation with a designed referral form.

Data Analysis: Data collected was analyzed for statistics using statistical software package (SPSS version 20). Where applicable, the simple mean and percentages were used while the Chi-square test and odd ratio were performed for significance analysis and measure of association. The results were then presented in suitable tables.

3. Results

Table 1 shows the socio-demographic profiles of the Okada riders who participated in the study. The Okada riders were predominantly between the ages of 20-30 years (84.70%) and majority claimed they have been riding bikes for 1-2 years (60.00%) and others 2.1 – 4 years (35.40%) with only 4.70% biking for over 4 years. Majority (129.00; 86.00) of them have been plying the road without license to ride bikes (table 1).

On the smoking status and accident pattern of Okada riders in Ekpoma (table 2), the results showed that 15.30% were positive for smoking status among which 2.70% and 14.70% reported the use of cannabis and cigarette respectively. However, only 12.0% said smoking improved their performances to biking. Also it was an observation that 47.30% of the Okada riders reported having been involved in one type of accident or the other with 9.3% and 6.7% reporting collision with cars and other Okada respectively and 31.3% claimed crash with persons, fall and collision with other objects.

Table 3 shows the visual acuity status of Okada rider in Ekpoma. Majority of the Okada riders (104; 69.3) have poor visual acuity taken with both eyes open. The prevalence of good visual acuity among bike riders in Ekpoma was

observed to be 30.10 in both eyes and 47.30 and 39.30 in right and left eyes respectively (table 3).

On the relationship between smoking and accident among Okada riders in Ekpoma (table 4), it was observed that smokers are more likely to have accidents than non-smokers. The relationship was a strong negative association.

On the relationship between accident status and visual acuity (table 5), it was observed that Okada rider who have had accidents were majorly with poor visual acuity. Specifically, bike men with poor visual acuity in both eyes,

right eye and left eye are about 1.49, 1.45 and 1.79 times more likely to have accident compared to those with good visual acuity.

The relationship between smoking and visual acuity (table 6) showed that smokers are 1.01, 1.83 and 1.00 times more likely to have poor visual acuity than non-smokers in both, right and left eyes respectively. Although there was no statistically significance, the association between smoking and poor visual acuity was a positive correlation.

Table 1. Socio-demography profiles of the Okada riders who participated in the study.

Demography profile	Variables	Frequency	Percentage (%)
Age (years)	20 – 30	127	84.70
	31 – 40	23	15.30
Years of Biking	1 – 2	90	60.00
	2.1 – 4	53	35.40
	4.1 +	7	4.70
License to bike	Yes	21	14.00
	No	129	86.00

Table 2. Smoking status and accident pattern among Okada riders in Ekpoma.

Smoking status and accident pattern	Variables	Frequency	Percentage (%)
Smoking status	Yes	23	15.30
	No	127	84.70
Cannabis	Yes	4	2.70
	No	146	97.30
Cigarette	Yes	22	14.70
	No	128	85.30
Smoking increase biking performance	Yes	18	12.00
	No	132	88.00
Accident status	Yes	71	47.30
	No	79	52.70
Crash object	Car	14	9.30
	Bike	10	6.70
	Person/ Fall/ Other objects	47	31.30

Table 3. Visual acuity status of bike riders in Ekpoma.

Eye side	Visual acuity	
	Poor	Good
Both eyes	104 (69.3%)	46 (30.1%)
Right eye	79 (52.7%)	71 (47.3%)
Left eye	91 (60.7%)	59 (39.3%)

Table 4. Relationship between smoking and accident.

		Accident status		Odd ratio	Sig
		Yes	No		
Smoking Status	Yes	55(36.70%)	72(48.00%)	3.03	X ² =0.020 P<0.05
	No	16(10.70%)	7(4.70%)		

Table 5. Relationship between accident and visual acuity.

Eye side	Accident status	Visual acuity		Odd ratio	Sig
		Poor Visual	Good visual		
Both	Yes	46 (30.70%)	25 (16.70%)	0.67 or 1.49	X ² = 0.1
	No	58 (38.79%)	21 (14.00%)		
Right	Yes	34 (22.70%)	37 (24.60%)	0.69 or 1.45	X ² = 0.193
	No	45 (30.00%)	34 (22.70%)		
Left	Yes	38 (25.3%)	33 (22.00%)	0.56 or 1.79	X ² =0.035
	No	53 (35.30%)	26 (17.30%)		

Table 6. Relationship between smoking and visual acuity.

Eye side	Smoking Status	Visual acuity		Odd ratio	Sig
		Poor Visual	Good Visual		
Both	Yes	16(10.70%)	7(4.70%)	1.01	$X^2 = 0.468$
	No	88(58.70%)	39(26.00%)		
Right	Yes	15(10.00%)	8(5.30%)	1.85	$X^2 = 0.336$
	No	64(42.70%)	63(42.00%)		
Left	Yes	14(9.30%)	9(6.00%)	1.01	$X^2 = 0.965$
	No	77(51.30%)	50(33.40%)		

4. Discussion

The present study shows that considerable percentage (15.30%) of Okada riders are smoking with about 14.70% smoking cigarette. This finding is in line with the WHO report on smoking status of Nigeria adults (WHO 2002) and similar to the recorded prevalence of 13% and 16.1% among adolescent in Calabar City and Lagos States respectively (Odey et al., 2012; Adeyeye, 2011). Our study also showed accidents to be prevalent among Okada riders in the study area with fall and collision with person and other objects being the most prevalent (table 2). This high prevalence of accident (47.30% table 3) observed in this study is in line considering the facts by Willette and Walsh (1983), Asogwa (1978) and Ezenwa (1986) that all point toward the endemic nature of accident in Nigeria. This high prevalence may also be due to the fact that majority of the Okada riders are young adults. This assertion is based on the fact that the prevalence of accident is more disturbing among the young adults group as reported by Asogwa (1980) and Oyemade (1973).

The prevalence of poor visual acuity observed among Okada rider in the study was 69.30% (with 52.7% in the right eye and 60.7% in the left eye) (table 3). This prevalence is high compared to the 3.9% visual field defect amongst drivers in Ibadan reported by Nwosu (1991) or the 3.3% found in drivers in Ife Central LGA reported by Oladehinde et al. (2007). This wide variations between this study and those by Nwosu (1991) and Oladehinde et al. (2007) can be explained partly by the difference in the nature of transportation means. This study was on bike riders who are more exposed to sun and other environmental factors compare to the car drivers. In addition, they are more likely to be of the lower socio-economic classes and thus the wide differences. The environmental and social factors differences may have acted as confounding factors and impacted on the present observation. Thus, this finding of this study therefore indicates that about 1 in 3 Okada riders operating in the study area have poor visual acuity. This observation is in accordance considering reports by other studies that showed a number of drivers in Nigeria to operate on the roads with vision below the legal requirement (Effiong, 1993; Nwosu et al., 1991).

On the relationship between smoking and accident, this study showed that an Okada rider who smokes is over 3 times more likely to be involved in bike accident compared to non-smoker. Interestingly, the prevalence of bike accident

among cigarette smoking Okada riders was statistically significant ($X^2 = 0.020$; $P < 0.05$) when compared to non-smoking Okada riders. Our finding is in line considering that smokers can have performance decrements while abstaining, due to mood and cognitive performance deteriorates within a few hours of beginning to abstain (Sommese and Patterson, 1995). In fact, smoking while driving has been shown to increase accident rate and mortality risk (Brison, 1990; DiFranza et al., 1986; Grout et al., 1983). This is reported to be due to distractions, lapses of manual dexterity, or blurred vision from smoke (National Institute for Occupational Safety and Health, 1979).

Also in the present study, the relationship between accident and vision was studied. It was our finding that Okada riders in the study area with poor visual acuity are about 1.5 times more likely to have accidents with their bike compared to non smokers. This finding therefore indicates an association between accident and visual acuity with the relationship significantly different with poor visual acuity in the left eye. Similar significant but yet weak relationship has been observed among drivers in several studies (Davison, 1985; Ivers et al., 1999; Marottoli et al., 1998). However, other studies have reported the opposite (Johansson et al., 1996; Marottoli et al., 1994; McCloskey et al., 1994; Owsley et al., 1998a; Owsley et al., 2001).

Our findings on the relationship between smoking and visual acuity (table 6) showed a not statistically weak positive correlation ($OR = +1.01$; $X^2 = 0.468$). However, it was shown that Okada riders that smoke are over one time more likely to come with poor vision compared with the non smoker with the greatest impact observed in the right eye ($OR = 1.85$; $X^2 = 0.336$). Indeed, a recent study has previously reported patients who are current smokers to have poorer vision and need longer treatment (Türkcü et al., 2014). Previous studies have also noted direct and passive effects of cigarette smoke exposure on the eye (Sebben et al., 1977; Basu et al., 1977; Shephard et al., 1978) and reactions include irritation, with an immediate disturbance of vision, lacrimation (Shephard et al., 1978), and a shortening of the time to break up of the tear film (Basu et al., 1977). The observed effect of smoking on visual acuity may have acted through these means to bring about the poor visual acuity reported in this study. Specifically, Nicotine (psychoactive component of tobacco) has been reported to go with many negative effects such as increased risk for a variety of ocular diseases (Galor and Lee, 2011; Cheng et al., 2000; Solberg et al., 1998). Thus, our findings on the relationship between

smoking and accident reported in this study maybe due to the effect of smoking on vision.

Conclusively, this study showed that Okada riders in Ekpoma have poor visual acuity that maybe implicated in the accident rate and maybe due to cigarette smoking. This relationship may also be related to the status of the Okada riders as it was observed that the majority of the Okada riders have no license to ride bikes and are with less than 2 years biking experience. Thus, the high accident rate in the study area cannot be unrelated with other factors such as years of experience and the determination of biking ability. Moreover, the high prevalence of poor visual acuity maybe related to other socio-demographic and environmental factors that are beyond smoking status.

It is therefore our recommendation that visual acuity screening be carried out for Okada riders in the study area and other areas with similar characteristic. This is in addition to recommending visual acuity testing as a means for obtaining license to ride bike within the country. In addition, Okada riders should be educated on the harmful effect of smoking and the preventive influence of the use of sun glasses while biking.

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